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EXAMINER	
PICH, PONNOREAY	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/479,304	RHOADS, GEOFFREY B.	
	Examiner	Art Unit	
	Ponnoreay Pich	2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-80* is/are pending in the application.

4a) Of the above claim(s) *75-80* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-73* is/are rejected.

7)☒ Claim(s) *74* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Newly submitted claims 75-80 are drawn to non-elected claims that were previously presented. Accordingly, claims 75-80 are withdrawn from consideration as being directed to non-elected inventions. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 52-74 were examined.

Response to Arguments

The remarks filed by applicant on 10/11/07 have been fully noted. Pages 9-12 of the remarks filed by applicant on 10/11/07 contain an excellent summary of the Reeds (US 5,513,245) and Hopper (US 3,406,344) references. The point of contention therefore is whether or not the invention being claimed would have been obvious over the teachings of these two references. It is noted that since the last office action, the Supreme Court has decided a case related to the matter of obviousness which is germane to the matter of obviousness determination for the present application, see *KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007)*. The SC establishes that a person of ordinary skill in the art is not an automaton, but rather someone having ordinary creativity and common sense. The SC also states that when work is available in one field, design incentives or other market forces can prompt variations of it, either in the same field or in another. In KSR v. Teleflex, the SC further discusses several possible rationales for finding obviousness which includes:

1. Combining prior art elements according to known methods to yield predicable results.

2. Simple substitution of one known elements for another to obtain predictable results.
3. Use of known technique to improve similar devices in the same way.
4. Applying a known technique to a known device ready for improvement to yield a predicable result.
5. "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.
6. Some teaching, suggesting, or motivation in the prior art that would have lead one of ordinary skill in the art to modify the prior art reference or to combine the prior art reference teachings to arrive at the claimed invention.

Reeds is related to cellular telephony authentication (col 1, lines 6-8). As applicant has summarized in page 10 of the remarks filed, during a handset registration process, a local base station transmits a RAND sequence to the handset, which is used in a challenge-response protocol. A hashed authentication string is formed by applying a Jumble procedure to a string formed by concatenating RAND + ESN + MIN1 + SSD-A. The result of the Jumble procedure is transmitted from the handset to the base station, which also calculated a corresponding Jumble string, which is used to authenticate whether or not the handset should be registered. Reeds also uses additional security measures in his invention, which includes speech encryption, occasional re-authentication, and control message encryption (col 9, lines 19-25). In Hopper's invention, data signals are added to a voice signal in such a manner that the

data signal is virtually undiscernible to the recipient of the voice signal (col 1, lines 57-62). This steganographically encoded voice signal is then transmitted to the recipient and the added data signal could then be used for various purposes such as line tracing or billing (col 2, lines 44-60).

On a first ground of traversal (p13 of remarks filed), applicant argues that it is too much to state that just because Reeds and Hopper are both from the field of telecommunication, they are both combinable. The examiner respectfully submits that the examiner was not stating that they were combinable merely because they are both from the field of telecommunication. The examiner was only pointing out that both references were from related field, thus it was likely that their teachings could be combined. The also examiner went on in the last office action to discuss why it was thought the references were combinable. Further, from the KSR v. Teleflex ruling, it is established that even if the references were not from related fields, it may be possible to combine teachings from unrelated fields provided there are valid rationales for doing so.

On pages 13-14 of the remarks filed, applicant argues that the motivation given by the examiner for combining Reeds and Hopper is illusory because there is no need for Hopper's teachings to identify the source of a call since Reeds teachings alone could accomplish this. The examiner in considering applicant's response agrees that the motivation given is "illusory" and in this office action will withdraw the motivation used in the last office action. However, the examiner respectfully submits that the claimed invention is still obvious over Reeds and Hopper in light of the KSR v. Teleflex ruling discussed above. Both references want to be able to identify a caller, but the method

utilized in each reference differs. Reeds utilizes a challenge-response authentication procedure while Hopper utilizes steganography to encode identifying data onto voice data. The examiner respectfully submits that it would have been obvious to one of ordinary skill in the art modify Reeds's invention such that rather than use the digital signature formed in the Jumble process in a challenge-response authentication protocol, the digital signature was instead steganographically encoded onto the voice stream as per Hopper's teachings. At least one rationale for why it would have been obvious is that the application of Hopper's steganographic teachings within Reeds's invention would yield the predictable result of a cellular telephony system in which a identification information/digital signature was steganographically encoded onto the voice signal.

Applicant argues that the successful decryption of speech sent from Reeds's handset confirms the identity of the caller. However, this is incorrect, because as recognized by several of the prior art already on record, it is commonly known that merely relying on use of an handset's ESN or encryption to identify a handset is unreliable since it is easy to fake a handset's ESN or encryption key. Reeds even discusses this problem in his background of the invention, hence why he uses a challenge-response authentication protocol based at least on a value sent from the base station instead of merely relying on an ESN or encryption to identify a handset.

Applicant argues that even if the combination of Reeds and Hopper were combined, the arrangement claimed would not be obtained. Applicant argues that an artisan would not be led to an arrangement in which the encoding signal depends at

least in part on information received by the radio receiver circuitry and stored in memory. Applicant states that Hopper marks his transmission with an identifier and such an identifier in Reeds's invention is in the form of the caller's phone number (MIN2+MIN1) or the ESN, thus would not be received by the radio receiver circuitry and stored in memory. The examiner respectfully disagrees that the identifier information most likely used from Reeds's invention is either the phone number or ESN. As discussed above, it is a well known prior art problem that merely relying on a phone number or ESN as an identifier is not reliable because such information is easily obtained and utilized in fraudulent calls. It would be more likely that the digital signature formed from the Jumble of RAND + ESN + MIN1 + SSD-A be utilized as the identifying information steganographically encoded onto the voice signal in the combination invention that resulted from combining Reeds and Hopper's invention. Note that in Reeds's invention, RAND is a signal sent from the base station and received by the handset via a radio receiver circuitry and stored in memory.

On page 15 of the remarks filed, applicant argues that the amendment to claim 58 overcomes the rejection made in the last office action by requiring an addition operation for combining the overlay signal with the data captured by the data captures system. Applicant states that this is different from the sidebands disclosed by Hopper which uses a multiplication operation for modulation. The examiner respectfully disagrees, Figure 2, item 30 of Hopper and column 3, lines 4-6 and 50-56 shows that an addition operation is used for modulation to yield a voice signal having sidebands.

Applicant's first argument for claim 62 presented on page 15 of the remarks filed is similar to what was presented for claim 52. The remarks by the examiner for claim 52 are also applicable for this argument to claim 62.

For applicant's second ground of argument for claim 62, applicant states that claim 62 requires that the steganographic encoder is adapted to generate an encoding signal that depends—in part—on dynamics of the data. Applicant states that Hopper does not teach this and points to page 10, lines 1-6 of the specification for clarification for what is meant by an arrangement based on dynamics. In response, the examiner respectfully submits that the limitation being argued by applicant is broader than what is disclosed by the specification. Claim 62 itself does not define what is meant by an encoding signal that depends at least in part on dynamics of the data. Hopper recognizes that speech is a noncontinuous signal and as such, the auxiliary signal, i.e. the encoding signal, is supplied to the modulator only during speech bursts (col 4, lines 44-57). This reads on the limitation being argued since the auxiliary signal only is supplied when voice data is active/dynamic. There is no requirement of scaling factor or first, second, or higher derivatives of the voice information having to be considered in claim 62 as recited contrary to what applicant is arguing.

On page 17 of the remarks submitted, applicant notes that if Hopper were combined with Reeds, Reeds's speech information could be steganographically encoded before or after encryption. A person of ordinary skill in the art trying various ways of combining the encryption and steganographic encoding techniques of Reeds and Hopper (as per the fifth rationale discussed above from KSR v. Teleflex) would

have come to the same conclusion. Applicant argues that claim 65 requires the steganographic encoder introduce the pseudo-random signal while in both the scenario that results from combining Reeds and Hopper's teachings, randomness is introduced not by the steganographic encoding, but by the encryption. The examiner respectfully submits that making things separate or integral is something that is obvious to one of ordinary skill in the art (see MPEP 2144.04), thus it would have been obvious to one skilled in the art when combining Reeds and Hopper's teachings to have an encoder that did both the encryption and steganographic encoding. In such a combination, the steganographic encoder does introduce the pseudo-random signal.

Applicant states that there is no suggestion in either Hopper or Reeds that would suggest encrypting steganographic encoding. However, this argument only considers the scenario where steganographic encoding is first done, then encryption. Applicant recognizes that from Reeds and Hopper's teachings, a second scenario where voice data is first encrypted and then steganographic encoding is performed is also possible. In such a scenario, one would not be denied access to identifying information due to encryption since the steganographic encoding is not done until after the voice data was encrypted.

As per claim 66, applicant argues that column 7, lines 34-44 cited by the examiner refers to a prior art psychoacoustic subband encoder, and does not refer to normalization performed by Lee's steganographic encoder. The examiner respectfully submits that making things separate or integral is something that is obvious to one of ordinary skill in the art (see MPEP 2144.04). While the cited section does refer to

normalization in the prior art for compression purposes and does not explicitly disclose that the normalization is performed by the steganographic encoder, it would have been obvious to incorporate the normalization function as taught by Lee into a steganographic encoder so that the encoder normalizes and encodes.

The related application and evidences of secondary consideration submitted by applicant were fully noted.

Response to Amendment

Applicant has amended each of the independent claims to add a limitation of "wherein data captured by the data capture system is digitally marked with the encoding signal prior to being transmitted by the data transmission system" or a limitation substantially similar to this. The examiner respectfully submits that such a limitation is inherent to the combination invention of Reeds and Hopper, thus the independent claims being amended with this new limitation does not change the scope of the claims from what was previously recited. In the proposed combination invention, rather than utilize the digital signature generated from Reeds's teachings in a challenge-response authentication procedure, the digital signature is utilized as identifying information to steganographically encode voice signal. The voice signal is data captured by the data capture system, i.e. microphone, of the cell phone. One skilled should appreciate that if the steganographic encoding as per Hopper's teachings is performed to add identification information to the voice signal, it would have to be done prior to transmission of the voice signal by the data transmission system. A signal that has already been transmitted cannot be encoded by the encoder of the cell phone. Even

considering Hopper's teachings alone, the identification information is steganographically added onto the voice signal and then the encoded signal is transmitted (col 5, lines 19-20)

Information Disclosure Statement

Documents listed in the IDS submitted on 10/11/07 have been considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

It is submitted that a person of ordinary skill in the art at the time applicant's invention was made is someone having at least an MS in Computer/Electrical Engineering and is familiar with steganographic techniques (or someone with equivalent industry experience).

Claims 52-54, 58-59, 72, 55-57, 60-65, and 70-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344).

Claim 52:

Reeds discloses a cell phone including a radio receiver circuitry (Fig 11, item 220), a memory (Fig 11, item 240), a data capture system and a radiant-energy digital data transmission system (Fig 11; col 4, lines 5-9; and col 11, lines 16-27 and 65-66). Note that all cell phones have a data capture system, i.e. microphone for a user to speak into.

Reeds further discloses that the cell phone is characterized in that the cell phone further includes an encoder that alters data captured by the data capture system in accordance with an encoding signal prior to transmission by the data transmission system (col 7, lines 21-34; col 9, lines 28-45; and col 11, lines 21-27). Note that the cited sections discusses that a RAND sequence is broadcasted from a base station to the cell phone. The cell phone uses the RAND sequence as an input into a Jumble process to generate an encoding signal, i.e. bits of group A, which is used to encode/encrypt the user's speech received by the cell phone before transmission.

Reeds further discloses wherein the encoder is adapted to generate an encoding signal that depends, at least in part, on information received by the radio receiver circuitry and stored in the memory (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). The RAND signal was received by the cell phone and stored in block 240. The encoding signal, i.e. bits of group A, is generated at least in part from the RAND signal received by the cell phone. The RAND signal is interpreted to be the claimed information received by the radio receiver circuitry and stored in the memory.

Reeds does not explicitly disclose that the encoder is a steganographic encoder and the encoding is steganographic encoding and wherein data captured by the data

capture system is digitally marked with the encoding signal prior to being transmitted by the data transmission system. However, Hopper discloses use of a steganographic encoder to perform steganographic encoding in a telephone system (col 1, lines 11-21 and 37-62). Note modulating the auxiliary data signal so that it is found in the speech signal's sideband such that the auxiliary signal is transmitted at the same time as the speech signal without interfering with the speech signal in any perceptible manner is steganographic encoding of the speech signal with the auxiliary signal. Hopper also discloses wherein data captured by the data capture system is digitally marked with the encoding signal prior to being transmitted by the data transmission system (col 5, lines 19-20).

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention using Hopper's teachings such that rather than use the digital signature in a challenge-response authentication protocol, one instead used steganography to redundantly encoded the user's voice signal by hiding an auxiliary identification signal (i.e. the digital signature from Reeds's invention) in the voice signal before transmission. The rationale for why it would have been obvious is that combining the prior art elements from Reeds and Hopper's invention would do no more than yield the predictable result of a cell phone system which authenticates a cell phone to a base station via use of a steganographically encoded digital signature.

Note that the RAND signal disclosed by Reeds is used for authentication purposes, and as such the RAND signal would have been an obvious choice to create

an auxiliary authentication signal from with which to use in steganographic encoding of the voice signal for line/caller identification purposes as per Hopper's teachings. Reeds discloses that to enhance security the cell phone is re-authenticated periodically (col 9, lines 24-25 and 47-50). Using Hopper's teachings to achieve re-authentication is an obvious choice because Hopper discloses that redundantly encoding a signal into the voice data for identification purposes would reduce the error rate in reception (col 4, lines 65-71). Whenever the base station of Reeds's modified invention wanted to re-authenticate the cell phone, all it has to do is check the authentication data that was steganographically encoded onto the voice data.

Claim 53:

Reeds further discloses that the data capture system captures audio, i.e. speech, and includes a microphone (col 9, lines 28-31). Note that all cell phones includes microphones to capture speech from the user.

Claim 54:

As per claim 54, Hopper further discloses that the steganographic encoder is adapted to operate transparently to a user of the telephone (col 1, lines 37-41 and col 4, lines 44-58), wherein all of the data captured by the data capture system and transmitted by the telephone is steganographically encoded (col 4, lines 44-58 and 67-73).

One skilled should appreciate that when two users speak to each other via a telephone system, any delay due to encoding of the signal for transmission is not noticed by the users, i.e. the encoding is transparent to the user. In the cited portions of

Hopper, the auxiliary data signal is transmitted at the same time as the voice signal without any action being taken by the user except for the user to speak as he/she would normally do when using a telephone. Hopper's invention continuously monitors for speech energy bursts via detector 13 and only when a burst is detected is the auxiliary data signal supplied for modulation with the speech signal. Further, Hopper discusses that it is preferred that the auxiliary code word is repetitively transmitted in the speech signal. This teaching would lead one of ordinary skill to steganographically encode all of the data captured by the data capture system since doing so would provide the maximum redundancy possible. The telephone being a cell phone is obvious over the additional teaching of Reeds.

Claim 58:

Hopper further discloses wherein the steganographic encoder is adapted to additively combine a digital overlay with the data captured by the data capture system (col 3, lines 44-61 and Fig 2, item 30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed digital overlay. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal. Note that as shown in Figure 2, an adder is used to combine the digital overlay with the voice signal.

Claim 59:

Hopper further discloses wherein the steganographic encoder is adapted to generate an overlay signal, i.e. the signal generated from repeating the code word, that is dependent on both a plural-bit auxiliary code and on the data captured by the data capture system (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the data signal which is encoded onto to the voice signal is made up of code words. The examiner considers these disclosed code words as plural-bit auxiliary codes. In encoding the (auxiliary) data signal onto the voice signal, the cited section in column 5 discusses that the amplitude of the data signal is adjusted so that it does not cause a noticeable distortion in the speech signal. This adjustment to the data signal is done by measuring the magnitude of the speech burst. As such, the generation of the auxiliary data signal, i.e. the claimed overlay signal, is dependent on both the code words, i.e. plural bit auxiliary code, and on the speech bursts, i.e. the data captured by the data capture system.

Claim 72:

Hopper further discloses wherein the steganographic encoder is adapted to generate an encoding signal that also depends – in part – on dynamics of the data (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the auxiliary signal is only supplied to the modulator if there is an active voice signal and how the amplitude of the auxiliary data signal is adapted so that it does

not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst and if there is an active speech burst.

Claim 55:

Reeds discloses:

1. Receiving input information, i.e. user's speech or voice data (col 4, lines 9-12 and col 9, lines 26-44).
2. Receiving data, i.e. RAND and/or RANDU sequence, wirelessly sent from a remote transmitter (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66).
3. Encoding the input information, the encoding depending, at least in part on the received data (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). *Note that the RAND signal is used to create a group of bits, i.e. group A, which is used to encode/encrypt speech data. As such the encoding/encryption depends at least in part on the received RAND signal.*
4. Transmitting the encoded information by wireless in a digital format (col 4, lines 9-12; col 9, line 28-44; and col 11, lines 16-35).

Reeds does not explicitly disclose the encoding is steganographically encoding to hide a plural-bit auxiliary code and that the data transmitted is steganographically-

encoded information; wherein the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted. However, Hopper discloses steganographically encoding a plural-bit auxiliary code, i.e. code word, in received input information, i.e. voice data, and that the information transmitted from the telephone is steganographically-encode information (col 1, lines 11-21 and 37-62). Hopper further discloses the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted (col 5; lines 19-20).

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention according to the limitations recited in claim 55 in light of Hopper's teachings by steganographically encoding the digital signature formed in Reeds's invention onto voice data as per Hopper's teachings. The rationale for why it would have been obvious to combine Reeds and Hopper's teachings to arrive at the invention as recited in claim 55 is the same as what was discussed in claim 52.

Claim 56:

Reeds further discloses:

1. Receiving the input information in a non-digital form (col 9, lines 28-44 and col 11, lines 21-27). *One skilled should appreciate that human speech is analog in nature. As such when the cell phone's microphone is used to receive the speech into the cell phone, the speech is received in analog format. Further evidence of this is that the information has to be converted into digital format. This means that the information was not in digital format when received.*

2. Expressing the received information in digital format (col 9, lines 28-44 and col 11, lines 21-27).
3. Encoding the digital form of the input information (col 9, lines 28-44).

Claim 57:

Reeds further discloses wherein the input information is audio information, i.e. speech (col 9, lines 28-44).

Claim 60:

Hopper further discloses wherein the steganographic encoding includes additively combining a digital overlay signal with the input information (col 3, lines 44-61 and Fig 2, item 30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

Claim 61:

Hopper further discloses wherein the steganographic encoding includes combining an overlay signal with the input information (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

Claim 70:

Hopper further discloses wirelessly communicating an identifier from the cell phone, wherein said plural-bit auxiliary code is at least partially redundant with said identifier, so that at least part of said identifier is sent from the cell phone in two different manners (col 4, lines 67-73).

Claim 71:

Reeds further discloses wherein said plural-bit auxiliary code comprises an identifier uniquely identifying the cell phone, rather than identify the input information or a user of the cell phone (col 7, lines 26-33).

Claim 62:

The limitations recited in claim 62 can all also be found in claims 52, 55, and 72 and as such, claim 62 is rejected over Reeds and Hopper for similar reasons discussed in claims 52, 55, and 72.

Claim 63:

Hopper further discloses the steganographic encoder is adapted to control an amplitude of the encoding signal, i.e. the auxiliary data signal, in part, in accordance with dynamics of the data, i.e. the speech signals (col 5, lines 3-30).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the amplitude of the auxiliary data signal is adapted/controlled so that it does not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst.

Claim 64:

The limitations further recited in claim 64 are substantially similar to limitations found recited in claim 52 and as such claim 64 is rejected for similar reasons discussed in claim 52.

Claim 65:

Most of the limitations recited in claim 65 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim 65 additionally recites "the steganographic encoder being adapted to introduce a pseudo-random signal to the data in which the hidden plural-bit auxiliary code is encoded". This limitation reads on encrypting the steganographically encoded data signal using a randomly generated key. Official notice is taken that encrypting signals

with a random key was well known in the art. At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds's invention such that the steganographic encoder was encrypted by introducing a pseudo-random signal to the data after the data signal was encoded by hiding the plural-bit auxiliary code within the data signal. One skilled would have been motivated to do so because it would ensure private communication on the cell phone. One skilled would have been motivated to use a pseudo-random signal as the encryption key because they offer a high level of security. Note that in just relying on steganography alone, an eavesdropper can still listen in on a cell phone call electronically. Note that Reeds was interested in encryption of the speech data (col 9, lines 24-25).

Claim 73:

Hopper further discloses data (i.e. voice) comprises a series of samples, and the steganographic encoder is adapted to generate an encoding signal that depends on the dynamics of several samples (col 4, lines 44-57).

Claims 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344) and further in view of Lee et al (US 5,687,191) and as evidenced by Jones (3,586,781).

Claim 66:

Most of the limitations recited in claim 66 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim

66 additionally recites "the host data comprising sample values, and the steganographic encoder being adapted to increase certain of the sample values and decrease others." Hopper discloses the host data, i.e. voice data, comprising sample values, i.e. speech bursts (col 4, lines 44-49 and col 5, lines 3-30).

Reeds and Hopper do not explicitly disclose the steganographic encoder being adapted to increase certain of the sample values and decrease others. However, the Lee discloses an encoder adapted to normalize sample values (col 7, lines 34-44). Normalization of the amplitude implies that the amplitude of samples that were above the mean value were decreased, while the amplitude of samples that were below the mean value were increased.

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds and Hopper's combination invention according to the limitations recited in claim 66 in light of Lee's teachings by having the steganographic encoder disclosed by Hopper also normalize sample values. One skilled would have been motivated to do so because as evidenced by Jones, speech signals typically vary over a dynamic range, some being very loud, i.e. having high amplitude, while others are very soft, i.e. having low amplitude, and modulating the amplitude of the speech samples so that they were more uniform, i.e. normalized, would improve the quality of transmissions (Jones: col 1, lines 28-36 and 65-69).

Claim 67:

Reeds, Hoper, and Lee do not explicitly disclose wherein the steganographic encoder is adapted to increase certain of the sample values between 7.5% and 100%.

However, as discussed in claim 66, as per Lee's teachings, it would improve transmission if the amplitude of the host data, i.e. voice samples, were normalized. This would mean that the amplitude of some of the samples would be increase, while some were decreased. It would not be unexpected that in normalizing some of the samples having low amplitude that the amplitudes may increase anywhere from 7.5% and 100%. It would not be unreasonable to assume that one of ordinary skill would try different percentages of increasing the amplitude of the lower amplitude samples and in routine experimentation find that some of the samples should be increased anywhere from 7.5% to 100% to achieve better quality of transmission.

Claim 68:

The limitations further recited in claim 68 are similar to what is recited in claim 72 and are rejected for similar reasons. Note that the encoding referred to in claim 72 is steganographic encoding to hide the plural-bit auxiliary code as recited in claim 68.

Claim 69:

Claim 69 recites limitations similar to those found in claims 55 and 66 and as such claim 69 is rejected over Reeds, Hooper, Lee, and as evidenced by Jones for the reasons discussed in claims 55 and 66.

Allowable Subject Matter

Claim 74 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponnoreay Pich whose telephone number is 571-272-7962. The examiner can normally be reached on 9:00am-4:30pm Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Ponnoreay Pich
Examiner
Art Unit 2135

PP